

**Supplementary Figure 1:** Flow chart of inclusion of inpatients with AECOPD in the present study. AECOPD: Acute exacerbation of chronic obstructive pulmonary disease; DBP: Diastolic Blood Pressure.



**Supplementary Figure 2:** Procedure of LASSO regression in the overall population. (A) LASSO coefficient profiles of the expression of all variables showed *P* < 0.05 in univariate Cox analysis. (B) Selection of the penalty parameter (λ) in the LASSO model via 100-fold cross-validation. The dotted vertical lines are plotted at the optimal values following the minimum criteria (left) and “one standard error” criteria (right).



**Supplementary Figure 3:** Forest plot showing HRs for the risk factors of in-hospital mortality based on multivariate Cox regression in the overall population excluding patients with pneumonia or sepsis. DBP: Diastolic blood pressure; Hb: Hemoglobin; HRs: Hazard ratios; ILD: Interstitial lung disease; NEUT%: Neutrophil ratio; RP: Radial pulse; SBP: Systolic blood pressure; WBC: White blood cell.

**Supplementary Table 1: Univariate Cox analysis on in-hospital mortality in the overall cohort of AECOPD inpatients.**

|  |  |  |  |
| --- | --- | --- | --- |
|  **Variables** | **HR (95% CI)** | ***Z*-value** | ***P***-**value** |
| Age | 1.68 (1.46– 1.95) | 49.46 | <0.01 |
| BMI (kg/m2) |  |  |  |
|  | <30 | 1.00 [Reference] |  |  |
|  | ≥30 | 0.31 (0.04–2.21) | 0.17  | 0.24 |
| DBP (mmHg) |  |  |  |
|  | ≥70 | 1.00 [Reference] |  |  |
|  | <70 | 3.02 (2.28–4.00) | 59.29 | <0.01 |
| Sex |  |  |  |
|  | Female | 1.00 [Reference] |  |  |
|  | Male | 0.97 (0.70–1.35) | 0.03  | 0.86 |
| Currently smoking |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 0.94 (0.71–1.25) | 5.70 | 0.68 |
| Hypertension |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.20 (0.90–1.59) | 1.56  | 0.21 |
| Coronary heart disease |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.17 (0.82–1.68) | 0.76  | 0.38 |
| Heart failure |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 2.57 (1.92–3.45) | 37.46  | <0.01 |
| Pulmonary tuberculosis |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 0.76 (0.36–1.61) | 0.53  | 0.47 |
| Chronic pulmonary heart disease |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.93 (1.44–2.57) | 19.90  | <0.01 |
| Pneumonia |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 3.02 (2.24– 4.07) | 52.35  | <0.01 |
| Bronchiectasis |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 0.77 (0.52– 1.14) | 1.75 | 0.19 |
| OSAHS |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 0.05 (0.00–65.05) | 0.67 | 0.41 |
| ILD |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.56 (1.06– 3.20) | 4.98 | 0.03 |
| Asthma |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 0.84 (0.34–2.02) | 0.16 | 0.69 |
| Osteoporosis |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.01 (0.53–1.92) | 0.00 | 0.97 |
| GERD |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 0.88 (1.77–4.58) | 1.95 | 0.16 |
| Active cancer |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.00 (0.60– 1.67) | 0.00  | 0.99 |
| Sepsis (<1 month) |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 4.37 (2.36– 8.07) | 22.10  | <0.01 |
| Stroke (<1 month) |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.53 (1.06– 2.22) | 5.21  | 0.02 |
| Diabetes |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.58 (1.15–2.18) | 7.96  | <0.01 |
| Chronic renal failure |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 2.27 (1.57–3.30) | 18.58  | <0.01 |
| Reduced mobility |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 3.02 (2.26–4.03) | 55.54 | <0.01 |
| Anxiety–depression |  |  |  |
|  | Without | 1.00 [Reference] |  |  |
|  | With | 1.47 (0.83–2.60) | 1.75  | 0.19 |
| Vital signs |  |  |  |
|  | Systolic blood pressure | 0.77 (0.67–0.89) | 13.02 | <0.01 |
|  | Diastolic blood pressure | 0.56 (0.50–0.64) | 82.62 | <0.01 |
|  | Pulse pressure | 1.16 (1.02–1.32) | 5.09 | 0.02 |
|  | Radial pulse | 1.25 (1.11– 1.42) | 12.92 | <0.01 |
|  | Respiratory rate | 1.07 (0.96– 1.19) | 1.47 | 0.23 |
|  | Mean arterial pressure | 0.60 (0.53– 0.68) | 59.01 | <0.01 |
| Laboratory tests |  |  |  |
|  | Red blood cell | 0.64 (0.54– 0.76) | 27.13  | <0.01 |
|  | Hemoglobin | 0.98 (0.98– 0.99) | 45.78  | <0.01 |
|  | White blood cell | 1.05 (1.03– 1.07) | 23.82  | <0.01 |
|  | NEUT  | 1.05 (1.03– 1.06) | 44.71  | <0.01 |
|  | EOSR  | 0.83 (0.75– 0.91) | 14.85  | <0.01 |
|  | Platelet | 1.00 (0.99– 1.00) | 10.90  | <0.01 |
|  | pH | 0.24 (0.09– 0.67) | 7.40  | <0.01 |
|  | PaO2 | 1.00 (1.00– 1.01) | 2.41  | 0.12 |
|  | PaCO2 | 1.01 (1.00– 1.02) | 2.87  | 0.09 |
|  | Lactate | 1.19 (1.10– 1.30) | 16.96 | <0.01 |

AECOPD: Acute exacerbation of chronic obstructive pulmonary disease; BMI: Body mass index; CI: Confidence interval; DBP: Diastolic blood pressure; EOSR: Eosinophil ratio; GERD; Gastroesophageal reflux disease; HR: Hazard ratio; ILD: Interstitial lung disease; NEUT: Neutrophil ratio; OSAHS: Obstructive sleep apnea-hypopnea syndrome; PaCO2: partial pressure of carbon dioxide; PaO2: Arterial oxygen partial pressure.